

Friday, 2/23/2007 9:54:10 AM  
Jean-Luc Menard

# Process Sheet

Customer : CU-DAR001 Dart Helicopters Services  
Job Number : 30935  
Estimate Number : 12727  
P.O. Number : **NIA**  
This Issue : 2/23/2007  
Prsht Rev. : NC  
First Issue : **NIA**  
Previous Run : 30739

Drawing Name : X-TUBE 412

Part Number : D412664245  
Drawing Number : D412-664-245 U/R  
Project Number : N/A  
Drawing Revision : U/R  
Material : **NIA**  
Due Date : 3/2/2007

**Rev C**  
**PL**  
**07.03.07**

Type : LANDING GEAR

Written By : **JP 07-02-23**  
Checked & Approved By :  
Comment : Est Rev:A New Issue 07-02-14 JLM

Qty: 2 Um: Each

Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 D6009129 Crosstube Material



Comment: Qty.: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6009-129 Crosstube **26548**

Check OD = 3.500"; ID = 2.250"

**BC 07.02.25**

2

2.0 MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

Turn as per Dwg D412-664-245

**BC 07.02.25**

2

3.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

**BC 07.02.25**

2

4.0 QC8

SECOND CHECK



Comment: SECOND CHECK

**En 07/02/26 (x2)**

5.0 LANDING GEAR 1

LANDING GEAR RESOURCE 1



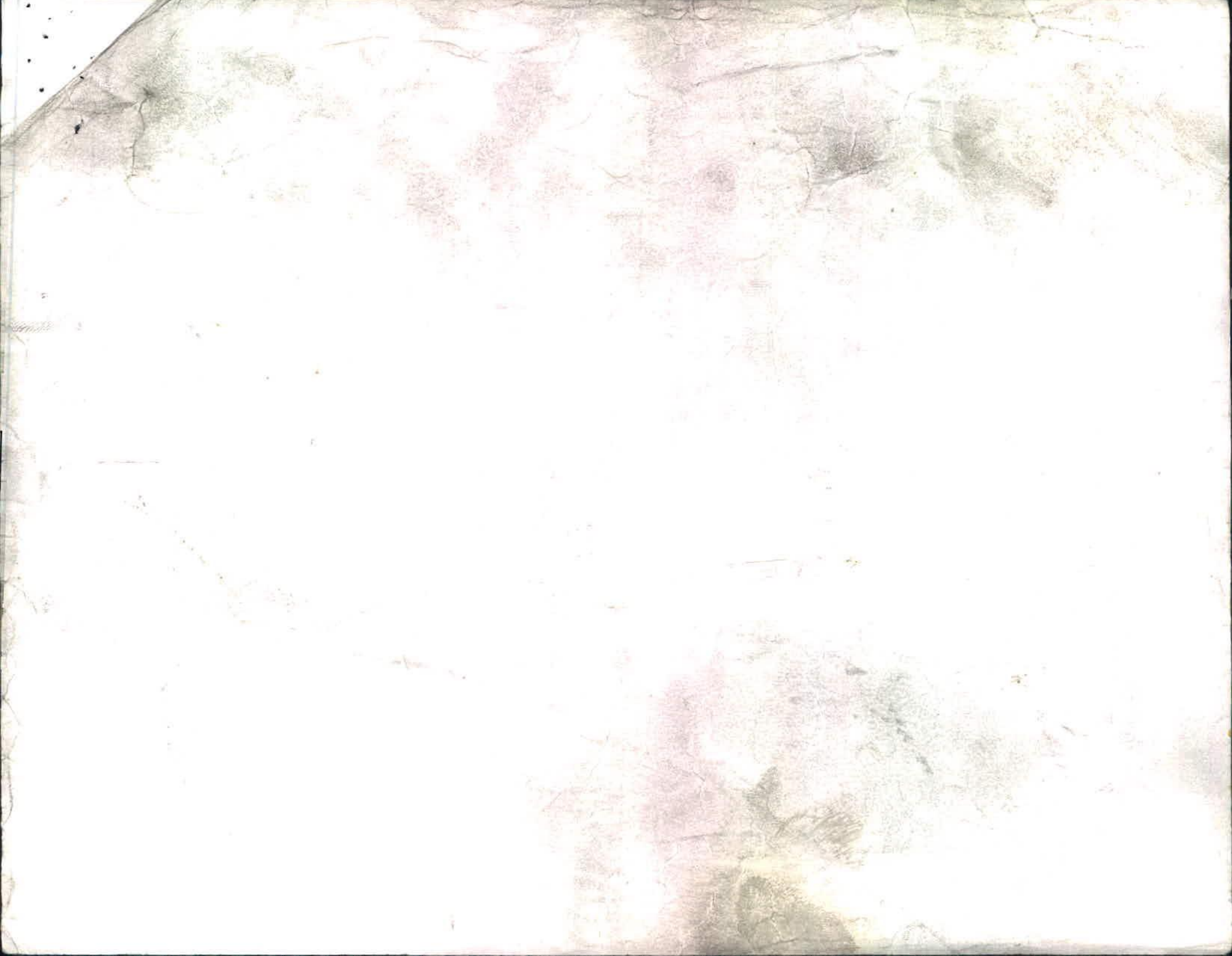
Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

**DP**

**7-2-26**

**(2)**





Friday, 2/23/2007 9:54:10 AM  
Jean-Luc Menard

# Process Sheet

Drawing Name: X-TUBE 412

Customer: CU-DAR001 Dart Helicopters Services

Part Number: D412664245

Job Number: 30935

Job Number:



Seq. #:

Machine Or Operation:

Description:

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

HAND FINISHING RESOURCE #1

7.0

HAND FINISHING1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

8.0

QC3/5

INSPECT WORK/WING WALK



Comment: Inspect work & Chemical conversion Coat

9.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010

10.0

QC6

DIMENSIONAL CHECK



Comment: DIMENSIONAL CHECK

11.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

- Cut Tube as per Dwg D412-664-245 EL 7-8-8

1-Drill pilot holes in tube as per Dwg D412-664-245

cutt btt 31635 EL 7-8-8

2-Ream hole to finish size in tube as per Dwg D412-664-245 EL-7-8-7

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-245

4-PTO EL 7-8-14

12.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

outsides service issue Pro  
LPI Penetrant inspection as per QSI 033

LPI as per ASTM 1417 level 2.

PK inspect for transit

C2071081140

EL 7-8-14

DP

7-3-5

5/7-8-0

4338

C207108110

1

DP

EL

7-3-5

5/7-8-10

Step #11

Sika flex 241  
41XCR3212-4-07

BH 104989

EP 8-1-1

Cherry River

B104071

EL 7-8-14

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## Process Sheet

Order: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE 412

Job Number: 30935

Part Number: D412664245

Job Number:



Seq. #:

Machine Or Operation:

Description:

13.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



ml 07-08-10



(i)

Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

RT 07-03-05

14.0

QC5

INSPECT WORK TO CURRENT STEP



End of 10



Comment: INSPECT WORK TO CURRENT STEP

UP 07.03.05

15.0

D2732

Rubber Extrusion



Comment: Qty.: 0.4830 f(s)/Unit Total: 0.9660 f(s)  
 Rubber Extrusion  
 2 X 5.8" pcs  
 Batch:

N/A as per dty 003 RT 07-08-17  
 N/A UP 07.03.05

16.0

D28961

Support



Comment: Qty.: 1.0000 Each(s)/Unit Total: 2.0000 Each(s)  
 Pick:  
 Qty Part number Description Batch  
 1 D2896-1 Support B27266

chafing shield 031891  
 2x B33561 RT 07-08-16  
 30200 RT 07-08-16  
 RT 07-03-05

17.0

D2856600

Abrasion Strip



Comment: Qty.: 0.9450 f(s)/Unit Total: 1.8900 f(s)  
 Abrasion Strip  
 2X D2856-600-1009  
 Batch: B26650

UP 07-03-05  
 (Qty 1)  
 B 26650 RT 07-08-16  
 DP 7-3-5

18.0

MS2192028

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total: 8.0000 Each(s)  
 Pick:  
 Qty Part number Description Batch  
 4 MS21920-28 Clamp 102534

B 103896 RT 07-08-16  
 N/A UP 07.03.05

19.0

MS2192032

clamp(per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total: 4.0000 Each(s)  
 clamp(per MIL-DTL-8783C)  
 batch: 102931

MS 21920-30 x 2 RT 07-08-16  
 M100154

44 Aucts PN# CR 3212-4-6 x 44 pieces Chafing shield 2x  
 M103688 RT D3189-1 B27414 RT

## Process Sheet

Order: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE 412

205

Job Number: 30935

Part Number: D412664245

Job Number:



Seq. #:

Machine Or Operation:

Description:

20.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Assemble as per Dwg D412-664-245

Instal support with magnobond 6398 per dwg D412-664-245,  
cure for 12hrs before packaging.

Time &amp; date of application:

9:30pm

ST 07-03-15

Batch:

IT 07-08-16  
5:30  
B 104723rubber strip  
3593 063 570  
x2  
B 33835

N/A CP 07.03.05

21.0

QC5

INSPECT WORK TO CURRENT STEP



E 07/08/17



Comment: INSPECT WORK TO CURRENT STEP

CP 07.03.05

22.0

ENGINEERING 1

ENGINEERING RESOURCE #1



Comment: ENGINEERING Approval

Approval of project manager:

CP 07.03.02

N/A. 12.

23.0

QC21

FINAL INSPECTION/W/O RELEASE



P 07/08/17

Comment: FINAL INSPECTION/W/O RELEASE

① 07.08.17

P 07/03/06

Job Completion



PCP 32186

CP

u 07.03.15

①

u 07.08.17



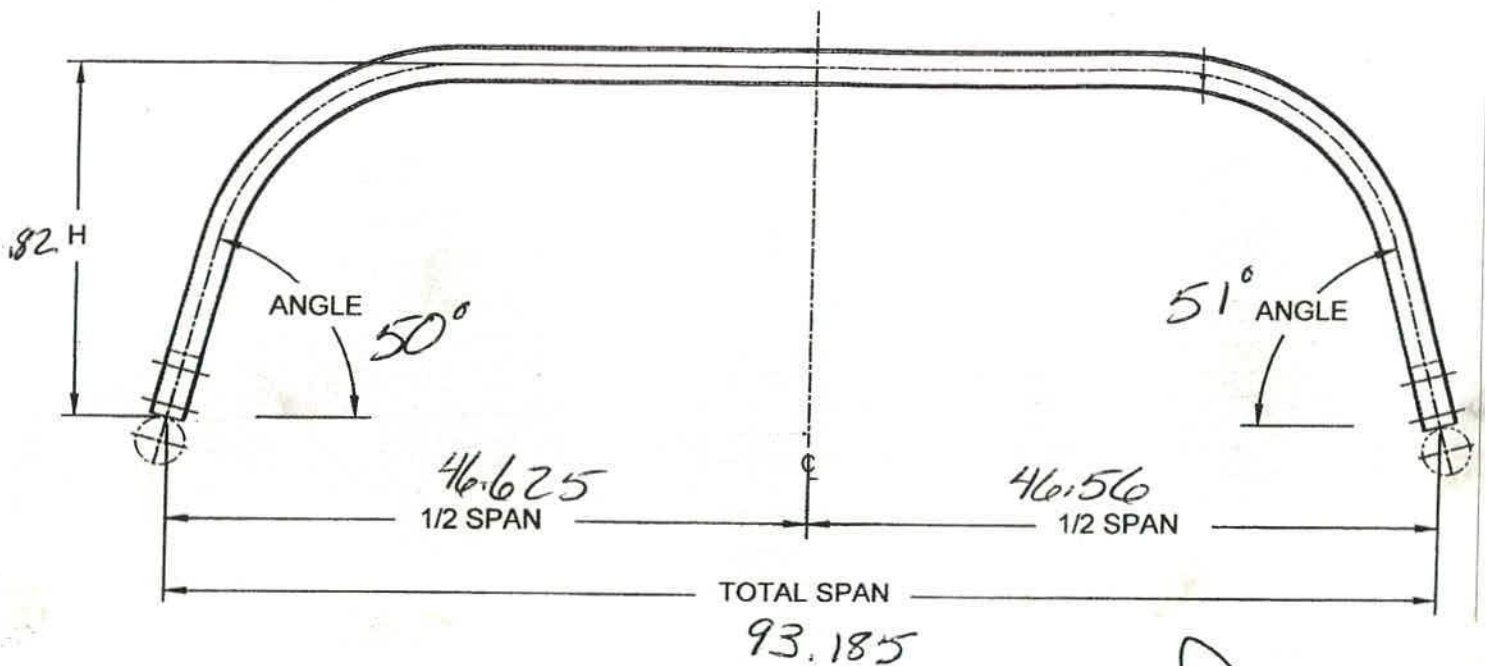
**FIRST ARTICLE INSPECTION CHECKLIST**

<input checked="" type="checkbox"/>	First Article	<input checked="" type="checkbox"/>	Prototype
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SIDE "A"

— 2015 —

# Crosstube Bend Dimension Sheet



PART NUMBER: D412-664-245

BATCH NUMBER: 30935

DRAWING: D412-664-245 REVISION: \_\_\_\_\_

H: \_\_\_\_\_

$1/2 \text{ SPAN}$ : \_\_\_\_\_

TOTAL SPAN: \_\_\_\_\_

ANGLE: \_\_\_\_\_

DP  
7-3-5

QC 15: \_\_\_\_\_

DATE: \_\_\_\_\_

QTY: \_\_\_\_\_

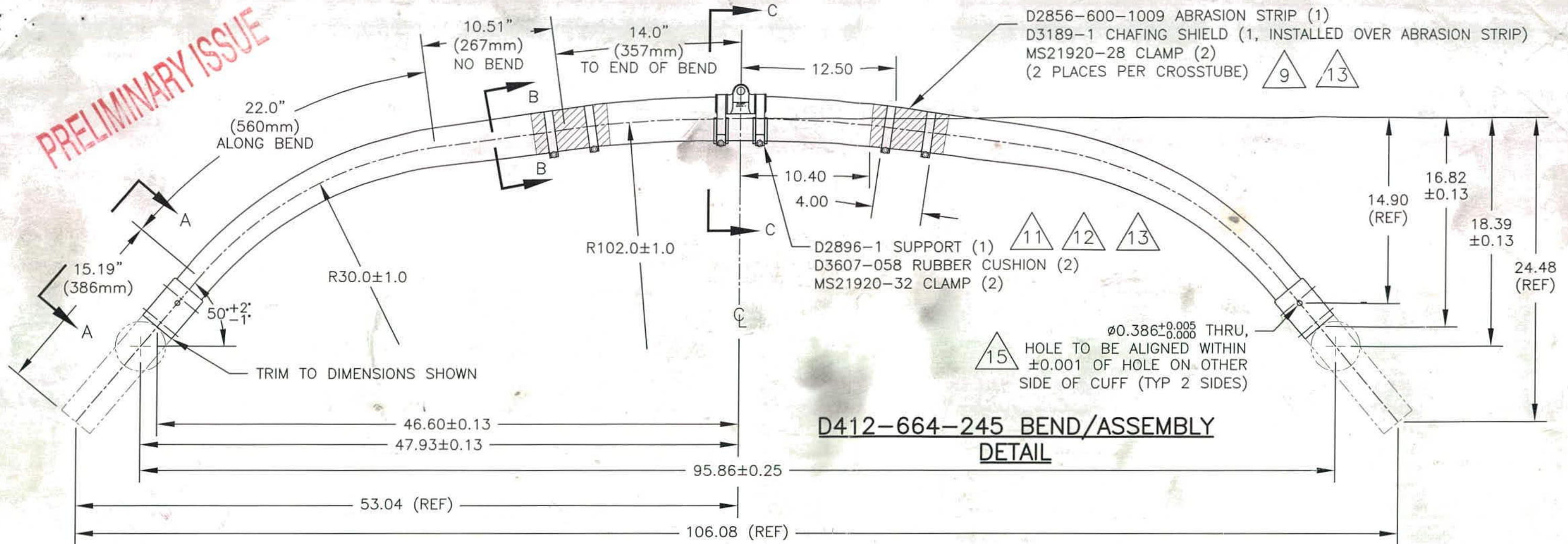
UNDERBENT  $\approx 0.125"$  IN CENTER.  
OVERALL SHAPE VERY GOOD.  
ACCEPTABLE DEVIATION

07.03.05

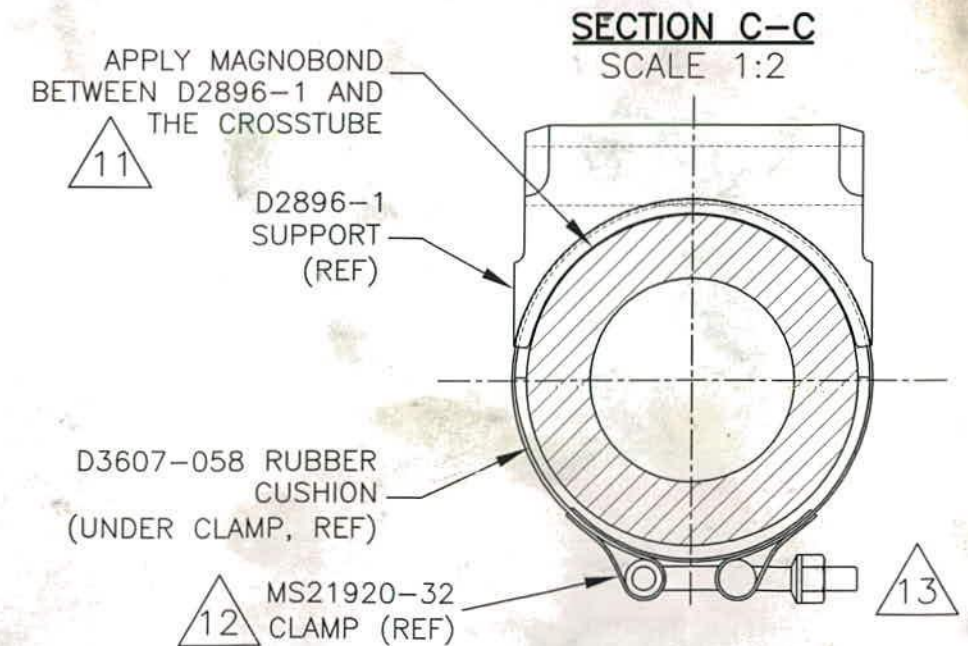
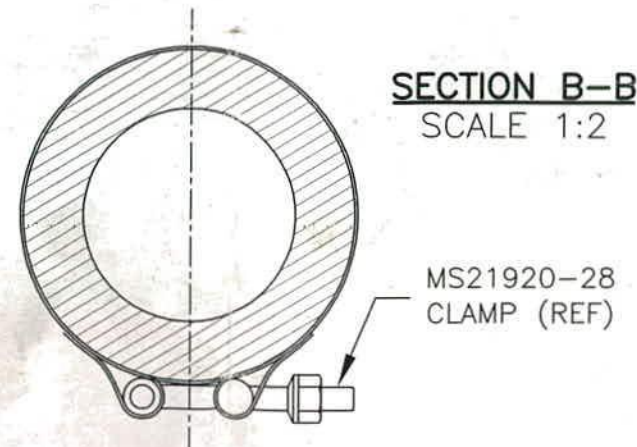
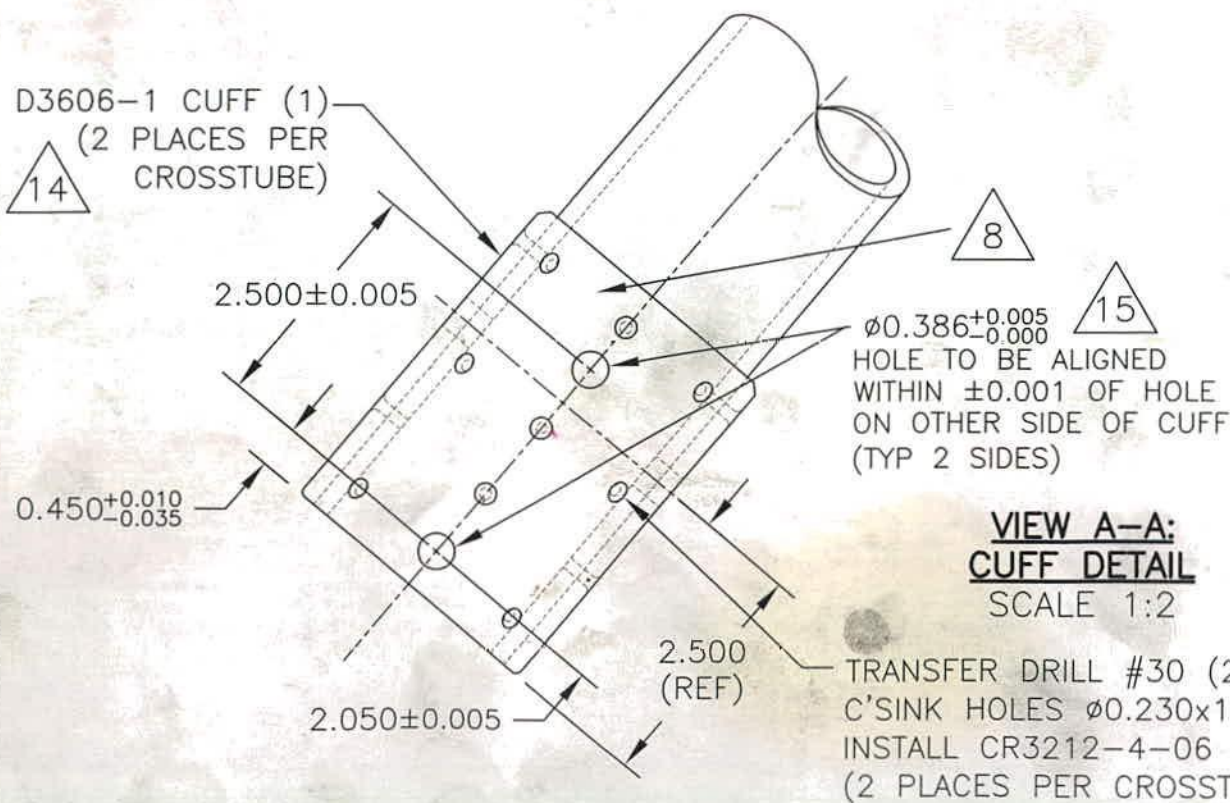
07.03.05



PRELIMINARY ISSUE



**D412-664-245 BEND/ASSEMBLY  
DETAIL**



TRANSFER DRILL #30 (22 PLACES,  $\phi 0.128$  REF),  
C'SINK HOLES  $\phi 0.230 \times 100^\circ$ ,  
INSTALL CR3212-4-06 RIVET (22)  
(2 PLACES PER CROSSTUBE)

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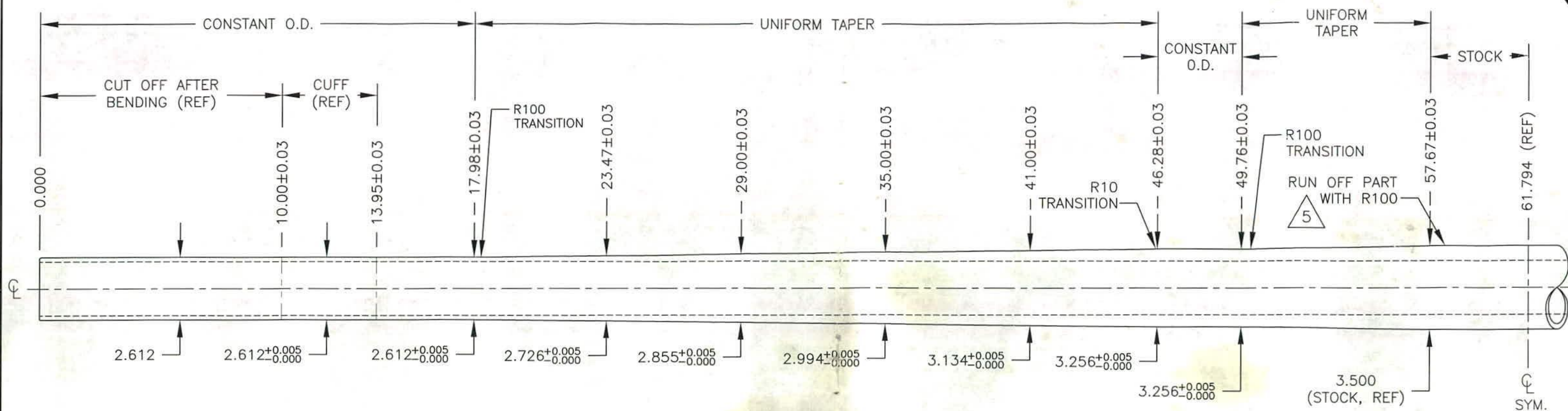
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CHECKED	APPROVED	DRAWING NO.	REV. B
DATE	TITLE	D412-664-245	SHEET 2 OF 3
07.03.01	CROSSTUBE (412 LOW-NARROW AFT)	SCALE	1:8









# **D412-664-245 MACHINING DETAIL**

**PRELIMINARY ISSUE**

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	CHECKED	APPROVED	DRAWING NO. D412-664-245	REV. B SHEET 3 OF 3
	DATE 07.03.01	TITLE CROSSTUBE (412 LOW-NARROW AFT)		SCALE 1:4

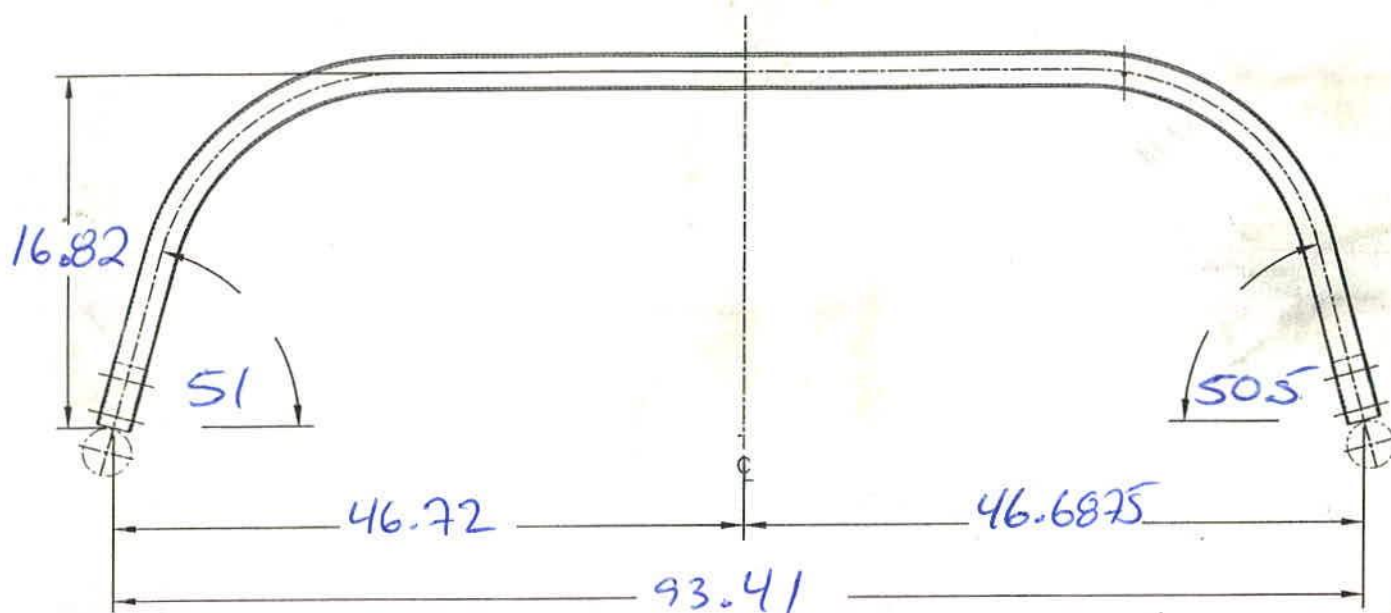






DART AEROSPACE LTD		Work Order:	30935
Description: Crosstube Low Narrow Aft (412)		Part Number:	D412-664-205
Inspection Dwg: D412-664-245      Rev: C		Page 1 of 1	

Required Dimension	Min	Max
Height	16.69	16.95
1/2 Span	46.47	46.73
Angle	49°	52°
Total Span	92.94	93.46



Comments
Middle is under bent. See Previous dim sheet for Eng. Approval.

QC15 Inspection	7-08-08
Date	

Rev	Date	Change	Revised by	Approved
A	07.04.27	New Issue	KJ/JM	<i>[Signature]</i>

**DART**

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CHECKED <i>H</i>	APPROVED <i>H</i>	DRAWING NO. D412-664-245	REV. C SHEET 1 OF 3
DATE 07.03.29		TITLE CROSSTUBE ASS'Y (412 LOW-N AFT) NTS	
A	06.12.01	NEW ISSUE	
B	07.03.01	CHG CUFF AREA, CHG RUBBER CUSHION	
C	07.03.29	CHG RIVET AND RUBBER CUSHION	

**RELEASED**07.04.24 *H***PARTS LIST:**

Qty	Part Number	Description
X	D412-664-245	CROSSTUBE ASSEMBLY (412 LOW-NARROW AFT)
1	D6009-129	CROSSTUBE
2	D2856-600-1009	ABRASION STRIP
1	D2896-1	SUPPORT
2	D3189-1	CHAFING SHIELD
2	D3595-063-570	RUBBER CUSHION
2	D3606-1	CUFF
44	CR3212-4-07	RIVET (OR M7885/3-4-07)
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH = 123.59±0.020 (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3606-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

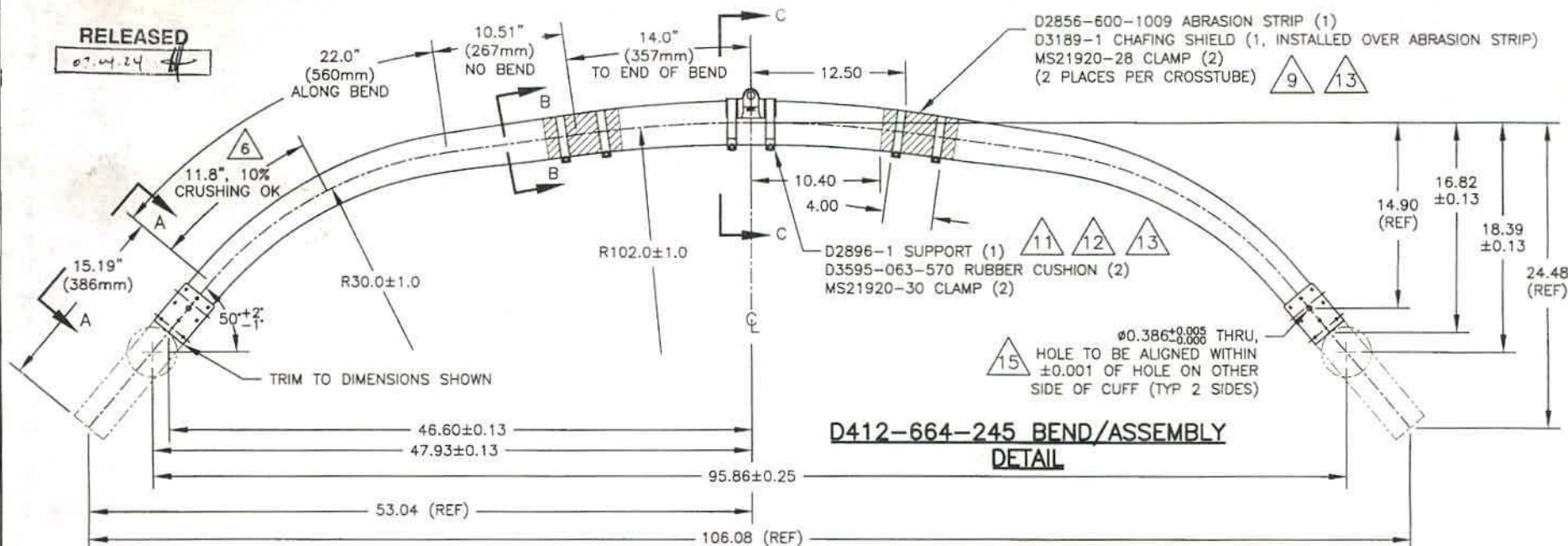
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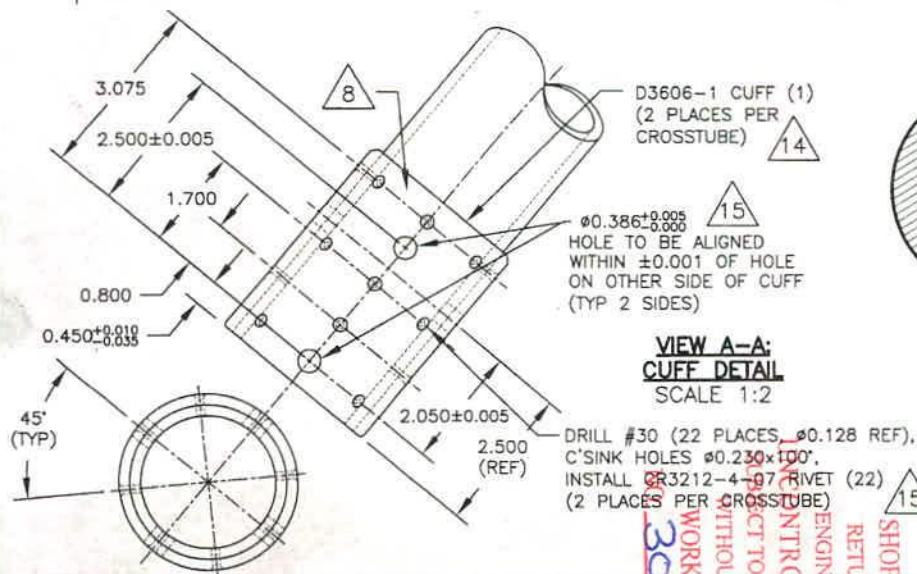
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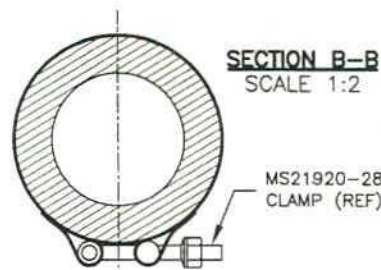
RELEASED



**D412-664-245 BEND/ASSEMBLY  
DETAIL**



**VIEW A-A:  
CUFF DETAIL  
SCALE 1:2**



**SECTION B-B  
SCALE 1:2**

APPLY MAGNOBOND  
BETWEEN D2896-1 AND  
THE CROSSTUBE

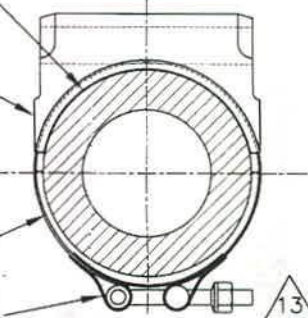
(11)

D2896-1  
SUPPORT  
(REF)

D3595-063-570  
RUBBER CUSHION  
(UNDER CLAMP, REF)

(12) MS21920-30  
CLAMP (REF)

**SECTION C-C  
SCALE 1:2**

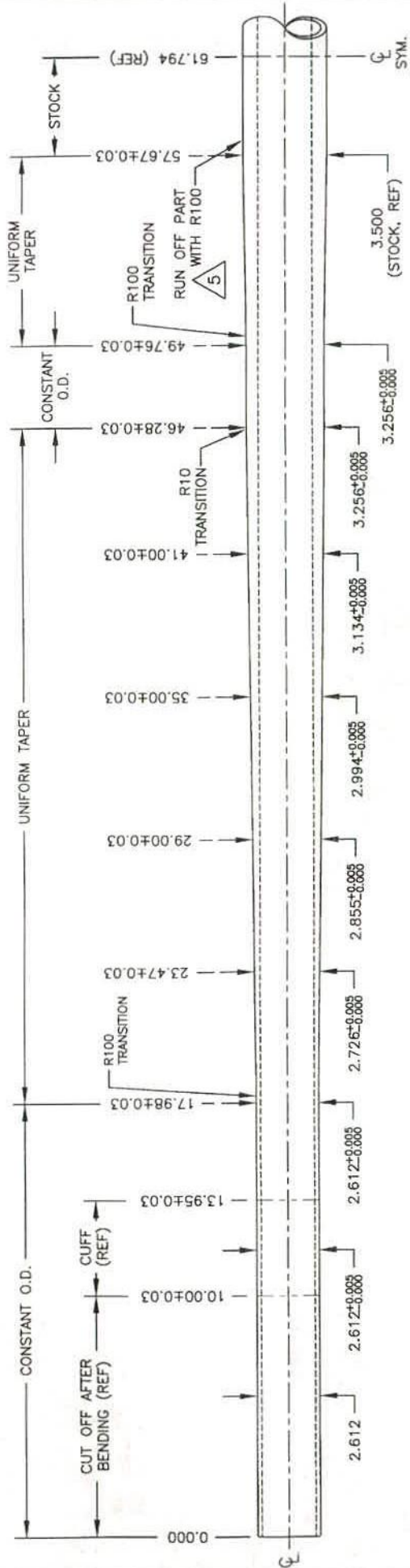


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CHECKED	APPROVED	DRAWING NO.	REV. C
DATE		D412-664-245	SHEET 2 OF 3
07.03.29		TITLE	SCALE
		CROSSTUBE (412 LOW-NARROW AFT)	1:2

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**D412-664-245 MACHINING DETAIL**

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07 04 19

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DESIGN	DRAWN BY	DRAWING NO.	REV. C
CHECKED	APPROVED	D412-664-245	SHEET 3 OF 3
DATE		TITLE	SCALE
07.03.29		CROSSTUBE (412 LOW-NARROW AFT)	1:4





# HeathAir

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3  
Tél.: (514) 636-1000 • Fax: (514) 636-0031

W.O. N° 37124

A.M.O. Number: 46/90

## NON-DESTRUCTIVE TESTING REPORT

### AIRCRAFT / COMPONENT INFORMATION

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

### INSPECTION REQUIREMENTS

Carry out FPI of (2) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.1.1 (on file at client) - parts delivered to HeathAir.

Qty (1) P/N D212-664-201 S/N's B32684.

Qty (1) P/N D412-664-245 S/N's B30935.

☐ RADIOGRAPHY

☐ ULTRASONIC

☒ PENETRANT

☐ MAGNETIC PARTICLE

☐ EDDY CURRENT

### INSPECTION REPORT

Fluorescent penetrant inspection was performed in accordance with the above requirements on (2) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive)  
Ardrox 970P25E Batch #04B503.

(2) cross tubes inspected. (2) PASSED / (0) FAILED.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH  
THE APPLICABLE STANDARDS OF AIRWORTHINESS

INSPECTED BY:

*B. Turpille*  
B. TURPILLE

DATE August 13, 2007

INSPECTION  
STAMP(S)

N/R

### CUSTOMER INFORMATION

CUSTOMER Dart Aerospace

P.O. NUMBER PO 00004338

ADDRESS:

CONTACT NAME Linda Lacelle

LABOUR @

MATERIALS @

TRAVEL EXPENSES @

HOTEL EXPENSES @

\$

GST

PST

INVOICE NO.

TOTAL \$

WHITE COPY - INSPECTION FILE • YELLOW COPY - CUSTOMER • PINK COPY - ACCOUNTANT